

TWO NEW SPECIES OF *CORDIA* (BORAGINACEAE) FROM CENTRAL AMERICA

Increased collecting efforts in Central America associated with various floristic projects have provided a wealth of new material. A large number of new species have been reported, and many others, previously poorly known, are now represented by a sufficient number of collections to be understood more adequately. Since 1970, efforts in southern Central America have rendered earlier works incomplete in terms of taxa included and distributional data. Recent studies of *Cordia* in Mexico and Central America (Miller, 1985), and preparations of treatments for floras of Nicaragua (Miller, in press) and Panama (Miller, in press) have uncovered two new species from Central America.

Cordia liesneri James S. Miller, sp. nov. TYPE: Costa Rica. Puntarenas: ridge north of airport, Rincón de Osa, 10 Feb. 1974, Ronald L. Liesner 1976 (holotype, MO 2664908; isotypes, AAU, US). Figure 1.

Frutex vel arbor parva 3–6(–8) m alta, ramunculis glabris. Folia persistentia, petiolis 6–11(–18) mm longis; laminae anguste elliptico-ovate, (11–)14.5–30(–40) cm longae, (3.8–)6.5–9.5(–13.5) cm latae, glabrae, apice longi-acuminatis, basi rotundatis ad obtusis. Inflorescentiae axillaris, (2.5–)6–8.5 cm latis. Flores sessiles, bisexualis; calyx tubulari-campanulatus, 5–6.8 mm longus, 3-lobatus; corolla alba, tubularis, 8.4–11 mm longa, 5-lobata, lobis oblongis, reflexis; stamina 5, filis 7.6–10 mm longis, puberulis, antheris oblongis, 1.3–2 mm longis. Fructus drupaceus, putamine inaequaliter ovoideo, 9–18 mm longo, 9–12 mm lato, rostrato ad apicem.

Shrub or small, slender-trunked tree 3–6(–8) m tall, the twigs glabrous. Leaves persistent, coriaceous; petioles 6–11(–18) mm long, broadly canaliculate adaxially, glabrous or nearly so; blades narrowly elliptic-ovate, (11–)14.5–30(–40) cm long, (3.8–)6.5–9.5(–13.5) cm wide, the apex long-acuminate, the acumen (2.3–)2.8–3.5(–4.6) cm long, the base rounded to obtuse or rarely acute, the margin entire, the adaxial surface glabrous or rarely minutely strigillose, the abaxial surface glabrous or minutely strigillose. Inflorescence axillary or sometimes internodal, pendulous, cymose, (2.5–)6–8.5 cm broad, the branches shortly brown-canescens. Flowers sessile, bisexual, monomorphic; calyx tubular-campanulate, 5–6.8 mm long, 3–4.7 mm wide at the mouth, ANN. MISSOURI BOT. GARD. 74: 670–673. 1987.

lacking ribs, sparsely and minutely brown-strigillose, 3-lobed, the lobes often somewhat unequal, deltate to ovate, 0.6–1.1 mm long; corolla white, tubular with reflexed lobes, 8.4–11 mm long, 5-merous, the lobes oblong, 2.4–4 mm long, 1.8–2.5 mm wide, the tube 4.4–7.2 mm long; stamens 5, the filaments 7.6–10 mm long, the upper 2.1–3.2 mm free, pubescent on the lower free portion and at the point of insertion, the anthers oblong, 1.3–2 mm long; ovary ovoid to broadly ovoid, 1.3–2 mm long, 1–1.3 mm broad; disc crateriform, 0.6–0.7 mm tall, 1–1.1 mm broad, glabrous; style 5.4–9 mm long, the stylar branches 2–3(–6) mm long, the stigma lobes clavate to nearly discoid. Fruits borne in the cup-shaped calyx, red or orange at maturity, drupaceous, the stone inequilaterally ovoid, rostrate at the apex, 9–18 mm long, 9–12 mm broad, the surface with low ridges, the endocarp bony.

Distribution. *Cordia liesneri* is known only from the Golfo Dulce region of Puntarenas, Costa Rica, where it occurs in wet forests below 200 m in elevation.

Among the Central American members of sect. *Myxa* (Endl.) DC., *Cordia liesneri* is distinctive in its oblong-ovate leaves longer than those of related species, axillary inflorescences, and bright red fruits containing large and prominently rostrate stones. This species is perhaps most closely related to *Cordia lucidula* I. M. Johnston with which it shares a similar habit of growth, relatively large, glabrous leaves, a 3-lobed calyx, and red drupaceous fruits. However, it differs from *C. lucidula* by having axillary inflorescences and rostrate endocarps.

Collections of *Cordia liesneri* have existed since Skutch and Allen collected in the Golfo Dulce region in 1947 and 1951 respectively. However, they have been identified incorrectly as *Cordia protracta* I. M. Johnston, which differs by its terminal inflorescences and pentamerous calyx, and as *Cordia eriostigma* Pittier, which differs in having terminal inflorescences and a campanulate corolla. Allen (1956) briefly described *C. liesneri* under the name *C. protracta* and stated that flowering occurs in December and that fruits mature in January.

Additional specimens examined. COSTA RICA. PUNTARENAS: region between Esquinas and Palmar Sur

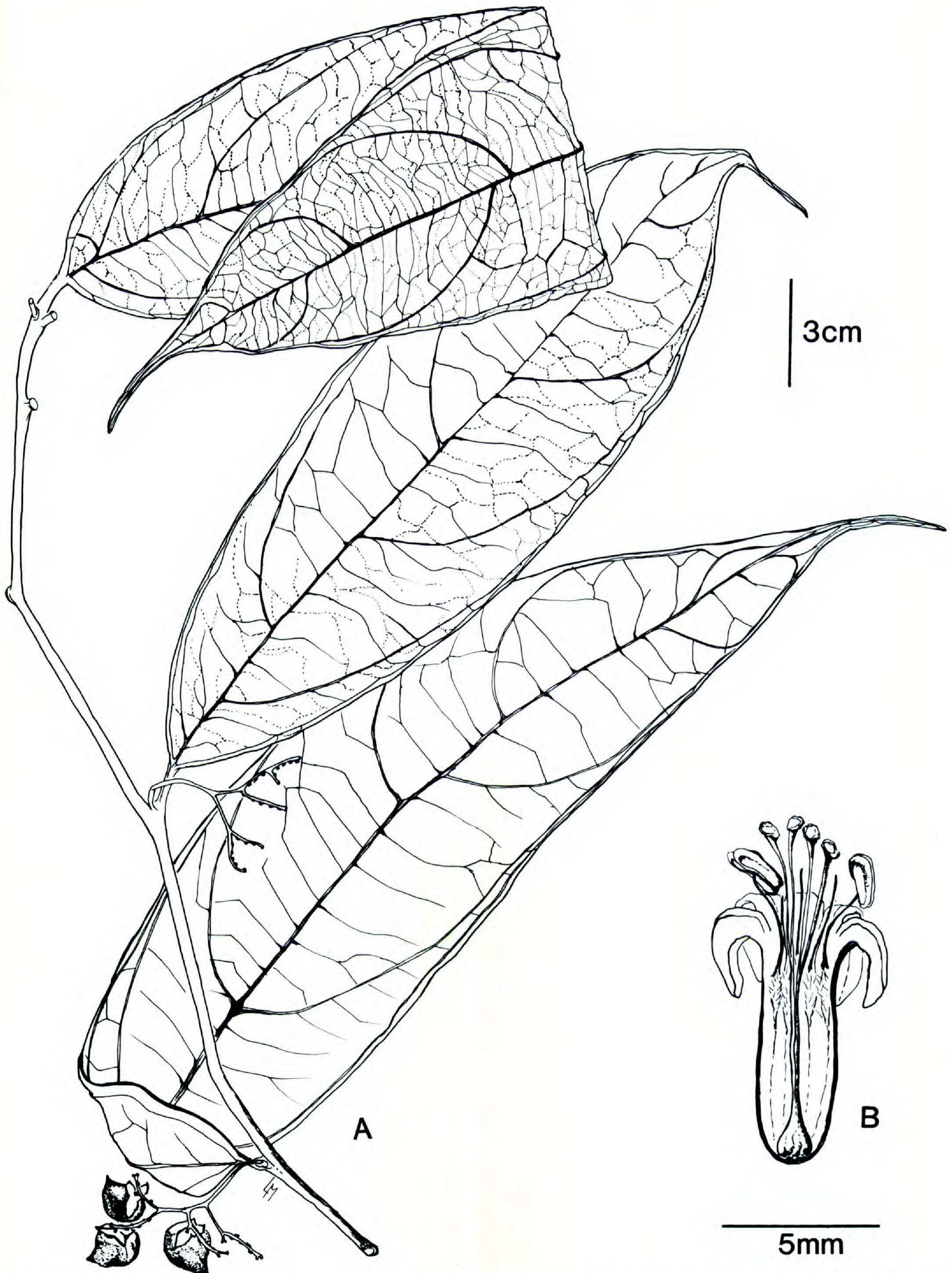


FIGURE 1. *Cordia liesneri*.—A. Fruiting branch, after *Liesner 1976* (MO).—B. Open corolla, after *Burger & Liesner 7224* (NY).

de Osa, elev. 30 m, *Allen 5772* [DS, F (2), GH, US]; region between Equinas and Palmar Sur de Osa, elev. 75 m, *Allen 5827* (DS, F); about 5 km W of Rincón de Osa, Osa Peninsula, elev. 50–200 m, *Burger & Lies-*

ner 7224 (CR, F, NY); slopes adjacent to airport, Rincón de Osa, *Liesner 1858* (AAU, CR, MO, US); Golfo Dulce and Río Terraba, elev. 30 m, *Skutch 5303* (F, MICH).

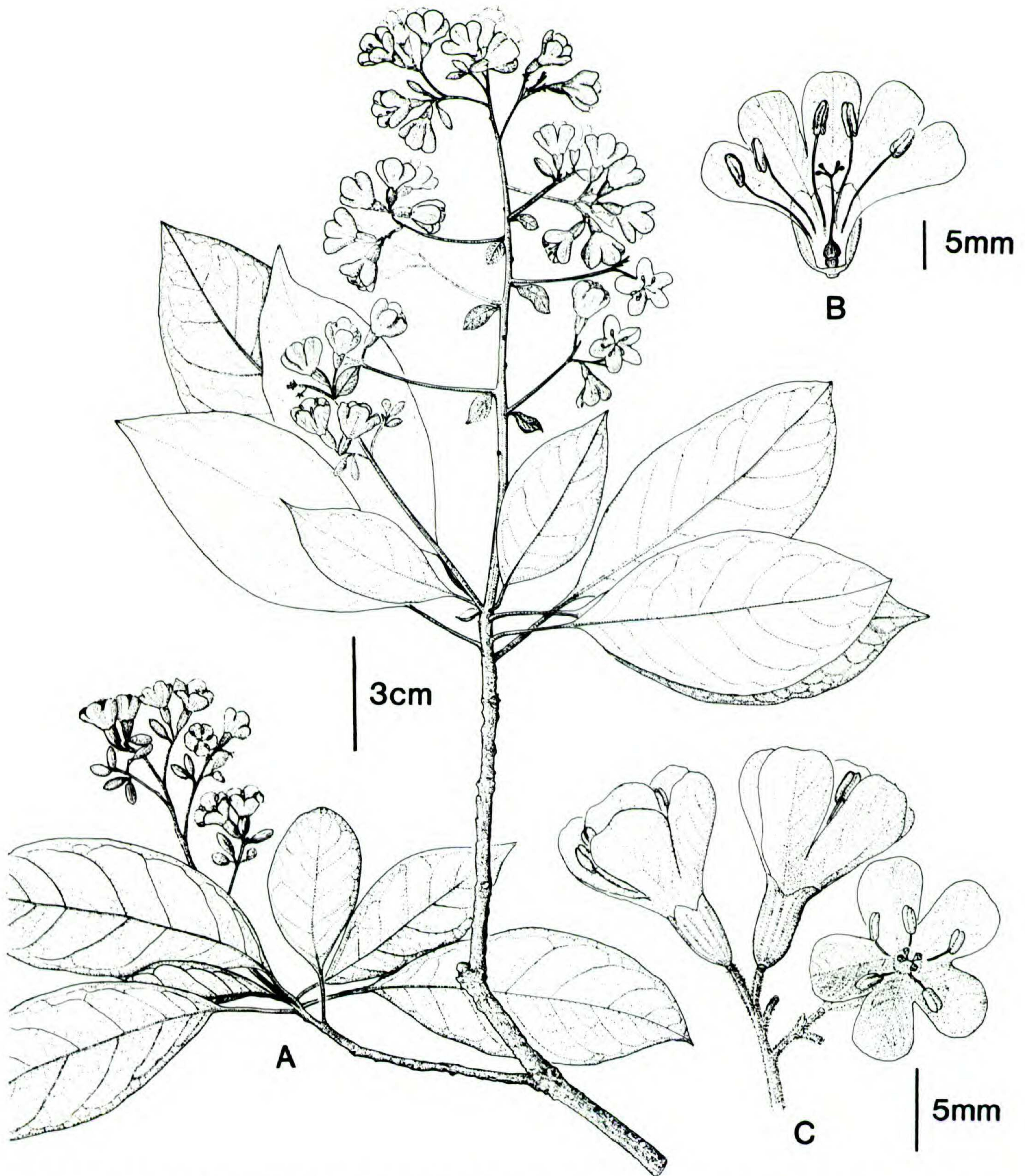


FIGURE 2. *Cordia cardenasiana*.—A. Flowering branch.—B. Open flower.—C. Apex of a flowering branch showing intact striate calyx. All after Contreras 6835 (holotype).

Cordia cardenasiana James S. Miller, sp. nov.
 TYPE: Guatemala. Petén: Cardenas, on rocky hill, 24 Mar. 1967, *Elias Contreras* 6835 (holotype, LL 279752; isotypes, DS, F, LL, US). Figure 2.

Arbor ad 15 m, ramunculis glabris. Folia deciduis, laminis ellipticis, 4.4–11.4 cm longis, 2.4–4.5 cm latis, glabris. Inflorescentia cymo-paniculatis. Flores hetero-

styli; calyx tubularis, 5–6 mm longus; corolla tubularis 14.2–16.8 mm longa, lobis 5, oblongis, 5.2–6.2 mm longis; stamina 5, filis glabris; ovarium obloidum, 1.2–1.4 mm longum; discus annularis. Fructus non visi.

Tree 15 m tall, the twigs glabrous. Leaves deciduous; petioles 8–30 mm long, canaliculate adaxially, glabrous; blades elliptic, 4.4–11.4 cm long, 2.4–4.5 cm wide, the apex acute to acu-

minate, the base acute, the margin entire, the adaxial surface glabrous but evenly papillose, the abaxial surface glabrous. Flowers on short pedicels to 1.5 mm long, distylous, borne with the leaves; calyx tubular, 5–6 mm long, 3–3.8 mm wide at the mouth, unequally lobed and tearing upon dehiscence or dehiscing circumscissily, striate or faintly costate, inconspicuously short-puberulent; corolla white, tubular with somewhat spreading lobes, 14.2–16.8 mm long, 5-merous, the lobes oblong, 5.2–6.2 mm long, 4.8–6 mm wide, the tube 4.7–5 mm long; stamens 5, the filaments 9.8–11.5 mm long, the upper 7–7.6 mm free, glabrous, the anthers oblong, 2.3–3 mm long; ovary obloid, 1.2–1.4 mm long, 1.3–2.5 mm broad; disc annular, 1.4 mm tall, 1.3 mm broad, glabrous; style 6.8–7 mm long, the stylar branches 1.4–1.6 mm long, the stigma lobes clavate. Fruits unknown.

Distribution. *Cordia cardenasiana* is known only from the type collection made in Petén, Guatemala.

Cordia cardenasiana is a small tree that must be quite attractive in flower. Like related species, it presumably produces all of its flowers in a short period during the dry season. It is assigned provisionally to sect. *Gerascanthus* (P. Br.) G. Don, but a definite sectional placement cannot be made until fruits are known. Members of sect. *Gerascanthus* have ellipsoid fruits with a fibrous wall, and the base of the style remains attached. Members of sect. *Rhabdocalyx* A. DC. have fruits with a bony endocarp; some species are otherwise indistinguishable from sect. *Gerascanthus*. Although *Cordia* is diverse in pollen morphology, the two sections share pollen grains of the same type (Nowicke & Ridgway, 1973), and this character cannot resolve the sectional placement of *C. cardenasiana*.

Cordia cardenasiana is probably most closely related to *C. gerascanthus* L., with which it shares glabrous leaves and a terminal, cymose-paniculate inflorescence. Although most populations of *C. gerascanthus* have pubescent staminal filaments, populations with glabrous filaments are known from southeastern Mexico (Johnston, 1950; Miller, 1985); filaments of *C. cardenasiana*

are glabrous. Among the Mexican and Central American species of *Cordia*, *C. cardenasiana* is distinctive in having parallel-sided corolla lobes, a character that it shares only with *C. alliodora* (Ruiz & Pavón) Oken, *C. gerascanthus*, and *C. globulifera* I. M. Johnston. A key is provided below, and a key to the remaining species of the section from this region is in Miller (1986).

- 1a. Plants with ant domatia; indument of stellate hairs *C. alliodora*
- 1b. Plants lacking ant domatia; indument of simple hairs.
 - 2a. Inflorescence cymose-paniculate.
 - 3a. Calyx striate or faintly costate, glabrous; corolla less than 18 mm long *C. cardenasiana*
 - 3b. Calyx costate, pubescent; corolla more than 20 cm long *C. gerascanthus*
 - 2b. Inflorescence condensed, nearly umbellate *C. globulifera*

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- James S. Miller, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, U.S.A.